

# Agro And Eco-Tourism Development In Rural Areas Of Uzbekistan: Analysis Using Of “Gravity” Model Approach

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## Abstract

The main purpose of the article is formulation of ways and favorable conditions and possibilities for development of agro and eco-tourism in rural areas of Uzbekistan. At the same time, inflow of tourists using approach of “Gravity” model was analyzed in order to identify theoretical and practical aspects of alternative identification of the share of tourism services in contemporary development of rural areas and agriculture of Samarkand region. Within the framework of our research, we studied theoretical and practical aspects of agro and eco-tourism and the rural areas of Samarkand region and collected statistical data was analyzed on the basis of “Gravity” model and forecasted indicators of tourism inflow were identified. As the result of the research, scientific and practically significant recommendations have also been developed and figured out.

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**Keywords:** Tourism, agrotourism, ecotourism, rural tourism, rural areas, national park, the “Gravity” model

## Introduction

The major changes of mankind’s life and activities started since the early years of the twentieth century. These changes appeared both in the development of science-technology and the creation and management of modern technologies. Human beings, who are considered to be both the creator of material needs and at the same time the consumer of those, are

gradually overcoming changes in each aspect of the life. Their philosophy, mental activity, worldview, and a higher level of thinking have changed.

After proclamation of independence, Uzbekistan formed markets based economy, chose its own model of development and at present the country is following the chosen way. Transition to a market economy has obviously become an objective necessity.

Market based economy is the phenomenon related to all possibilities and it is a path that should be stepped by all developing countries of the world during the civilization development. The strategic goal of transition to a market economy is, above all, to create appropriate living standards for people, to maintain prosperous life for them and finally, to obtain easily modern culture and knowledge as well. There is no other priority but to use properly all available resources and aim them to keep well pace of living of the population during the stage of transition to a new state of market relations. As mentioned earlier, Uzbekistan is following the path of democratic reforms which are aimed to intensively develop national economy of the country. That is why, current policies are pointed to provide good living conditions of the population in the future and all measures to maintain development of their material and spiritual resources aimed at creating a strong economic base.

At the moment, in all countries of the world, including Uzbekistan much attention is paid to the non-manufacturing economy, especially to tourism sector which has been on the rise. Humans always had to change the scope of their action, discover new places, and they were seeking to gain practical knowledge. People spend their free time effectively; they usually have a rest in order to ensure their recreation, to see the world, to learn traditions and values of other cultures. Tourism is standing in the leading positions in implementation of all aforementioned social activities and moves.

Although tourism is an ancient event, people started to make frequent travels just in the twentieth century, people's aspirations in the field of tourism grew and that prompted and triggered the development of tourism industry. Therefore, the efforts to develop tourism as a separate economic activity began in the second half of the twentieth century (Matthias, 2004). One of the fastest growing sectors of global market is tourism industry and global tourism flows and sustainable growth of the tourism income have been seen in recent years.

In some countries, travel and tourism sector has been developing continuously at a very stable growth rates, and its share of the total gross domestic product is on average 8-10%. For example, in 2014, this sector constituted 10.1% in France, 9.6% in Italy, 15.9% in Spain and 17.3% in Greece (<http://www.wttc.org>). This is evidence which shows that economy

of the sector is of vital importance for the development of whole national economy. It is noteworthy to mention that the tourism development lead to progress of such spheres as transport, market infrastructure, trade, and food industries, construction, craftsmanship and other service industries.

The service industry is considered as the most important resource and a factor for sustainable development of the economy of Uzbekistan (Karimov, 2015). In this approach, there is a huge role of the service sector in the country's socio-economic development. The tourism sector in the country, furthermore, has more significant role in improvement of quality of life and living standards of the people. These industry sectors, including the development of tourism in the theoretical, methodological and practical aspects, require a thorough examination of the development of new routes. At the same time, the importance of tourism should be considered. This sector is different from other sectors for its quick process of developing. Because, Uzbekistan has been paying great attention to the development of tourism and trying to find potential ways of the effective use of the tourism in recent years. So, the share of services in the country's GDP grew by 11.3% between 2007 and 2014. In 2014, the share of services in gross domestic product constituted 54% (<http://www.stat.uz>).

XXI century, according to some experts, is estimated to be more effective to develop tourism. In this century, tourism will be regarded as one of the key elements of Uzbekistan's national economy and will ensure its own contribution in terms of hard currency earnings of the budget. To realize this, our country has full capacity and sufficient grounds. The only thing to do would be to formulate and implement effective modern strategy for sustainable development of tourism in the country and the tourism industry should be raised into high positions. Tourism is not a new sector for Uzbekistan's economy; it has existed since the ancient times. We have to just make calculations in the field of tourism, take everything into the consideration and our tourism strategy should be based on the development and prospects of the task ahead of all.

Tourism industry is an industry which covers several types of services involving all networks inclined to provide entertainment for tourists. Cooperation in the field of tourism in the production of the agricultural and other types of products will lead to improvement of employability of partially employed and unemployed people; full and rational use of labor resources will create a foundation for solving the problem of unemployment. This is especially important for the least developed industrial regions. The cooperation in terms of tourism industry is the most suitable to better the financial state for those countries which do not have higher economic opportunities or could less effort to do other businesses. Tourism will help to reduce the problems of unemployment in these regions, the active non-public

sectors will help to attract the working-age population, extend the scope of the implementation of labor.

The co-operation in tourism sector helps to speed up the process of development of the economy, to use efficiently the existing resources and makes rural areas develop as well as cause the development of modern services and the improvement of people's living standards and prosperity of a positive impact on the professional development of employees. In addition, the tourism sector provides conditions to improve agricultural production and the development in great tempos. In the future, with the expansion of the service sector of the population the number of employed people will increase in the tourism service sectors. This is, of course, a key factor for the countries whose economy is not so developed. No matter whether the country is developed or not the tourism will help to make its economy better. So, tourism is the best way to reduce the unemployment rate, to cooperate with the financially advanced countries and influence to other aspects of life. It is one of the best features of prosperity in economy. Growth in developed or developing countries is the main factor that determines the quality of life and environmental sustainability. Tourism is specific sector of the economy, which is also makes a significant contribution to the area of the country's economy (Pardaev *et al.*, 2007). The reforms of agricultural sector and rural areas play a significant role in Uzbekistan's developing economy and the gross domestic product. In this approach, the share of tourism in the development of agriculture and rural areas, which is also known today, can be seen by the experience of foreign countries. There are many types of tourism and tourism can be classified according to a number of features. This article describes the development of modern and sustainable rural areas, aimed at the study of the effects of agro and eco-tourism. Agro and eco-tourism are directly related to rural tourism. Ecotourism is a type of travelling tourism which is closely connected with natural territories, in which the local area and the protection of social and economic status of the population have been attached importance too (Hoshimov, 2009 & Jumaev, 2004). The direction of ecotourism's development is associated with emergence of the green paradigm(model) and strong and real differences between the supply of the eco-tourists, i.e., the environmental priority elements in the Western paradigm have been controlling and influencing the commercial aspects of the industry (David, 2008). It is considered that all aspects of the development of eco-tourism have a positive impact on the environment; economic and environmental protection of rural areas; and this sphere interconnects national parks, the economy of the least developed villages and tourism relations (Martha, 2008).

In our scientific research we paid attention to the flow of tourists into the rural areas of Samarkand region. It is one of the largest and oldest

regions of Uzbekistan, and its geographical location creates a good opportunity to develop tourism. Samarkand is laid in the middle of the ancient “Great Silk Road” and its economic and social advancement of modern tourism; it ties the main aspects of development between the countries of the East and the West (Charles *et al.*, 2003).

### **Literature review**

Theoretical and practical aspects of the need for development of the diversified set of tourism services of Uzbekistan, including eco and agro-tourism services sector, the effectiveness of their various services, quality, value, cost, and other economic indicators were analyzed by the number of economists and the results of their works are reflected in the works of scientists and researchers. However, the issue of efficient use of existing touristic resources has not been thoroughly studied yet and to make this sphere at the same level as other modern touristic countries is our prior task. Accordingly, the economic literature on this topic has been published in few numbers. That demands to study the sphere of the tourism and learn both theoretically and practically the effective use of agro and eco-tourism resources.

The problems of development of tourism were discussed by Uzbek and foreign scientists involved in various aspects and dimensions. Tourism development characteristics, trends and companies engaged in tourism (Pardaev *et al.*, 2007), theoretical issues of the service system of ensuring development of sustainable tourism, socio-cultural and tourist-based and historical tours’ descriptions of the main features and the issues and needs of the population were described in details (Fayziev, 2007). Uzbekistan’s potential in tourism resources has been evaluated and possibilities in touristic activities were analyzed, the opportunities and prospects of the development of new tourism in some regions have been taken into consideration and perspectives of further development of tourism industry in our country have been formulated (Ibodullaev, 2008).

The development of tourism regions, in turn, creation of the opportunity to establish cooperation with other sectors of the economy and the basis of the development of tourism infrastructure (Mamatkulov, 2008), the structure and functions of the tourism market, the development of tourism products and services and theoretical and practical aspects of the tourism market specific features were revealed by scientific researchers and scientists (Tuxliev *et al.*, 2010).

Some of the most important issues for the development of tourism are creating a vast variety types of tourist routes, principles and routing services, creating appropriate routes in accordance with the development of ecological tourism routes, route planning project design, tourism promotion and

advertising of tour routes as well as mechanisms of ensuring the safety of the tourists are studied and expressed in details (Hayitboyev *et al.*, 2009).

Rural and agricultural economic development of the tourism sector, tourism, agro and eco-tourism in rural areas can be explained by the means of touristic directions. The main areas of agro and eco-tourism and the ways of developing it were analyzed by a number of scientists. The principles of ecological tourism, recreational tourism and their definitions, as well as the specifics of the development of eco-tourism development and ecotourism resources, estimation of potentiality and agricultural development in Uzbekistan are studied and analyzed and organizational as well as economic mechanisms of implementation of these proposals are formulated (Pardaev *et al.*, 2015). Agricultural enterprises in rural areas and recreation facilities in agricultural factories, agricultural activities, participating in agricultural activities and helping them can result in practical knowledge (Miroslav *et al.*, 2012).

### **Perspectives of tourism development in Uzbekistan**

Uzbekistan has enormous potential for development of tourism and this sphere is considered as highly competitive and the sphere plays very important role in the process of reforms aimed at formation of market economy. After proclamation of independence, the process of further development of market industry has been constantly taking place. It is widely known fact that alongside with universal patterns of economic development for all the countries of the world, each individual country's economic performance and indicators are evaluated separately taking into account geographical location, natural conditions, climate, population, natural resources and other factors.

From this point of view, Uzbekistan is a country which has unique, beautiful seasons, natural-climatic conditions, natural resources as well as hospitable population. Uzbekistan overall territory is about 44413.3 thousands hectares, including 25 million hectares of land which is used for production of a variety of agricultural products. Uzbekistan's population is about 31.5 million people, and majority of our population (more than 51%) resides in rural areas. At present, there are more than 7 thousand touristic objects in Uzbekistan which have historical-cultural, architectural and archeological value and it has to be noted that majority of these objects are included into the UNESCO's list of World Heritage and Uzbekistan is one of the top 10 countries of the world in terms of its touristic potential and historical monuments. Basing on statistical information, 545 of these objects are architectural monuments, 578 have historical value, 1457 of objects of art and more than 5500 have archeological value. Moreover, there are more than 300 museums in our country as well as about 1200 organizations of folk arts.

Despite this potential, the share of touristic services in the economy of rural areas is developing with a lower rate compared with other spheres. There are certain issues and problems which have negative impact on continuous development of tourism services market. More specifically, it means that distribution of touristic resources in rural areas and their use are not arranged effectively.

Improvement of material and cultural welfare of population plays crucial role in the development of all spheres of national economy. One of the most important problems here is to develop scientific grounds for elaboration of effective methods of using touristic resources in rural areas and identification of forecasted indicators in order to ensure development of the touristic services market of Uzbekistan and its further advancement.

Taking into account abovementioned it can be clearly seen that at present time significant attention is paid to create favorable conditions for development of this sphere in Uzbekistan and the process of formation, development and further advancement of market of tourism services in Uzbekistan is undergoing a new stage.

Certain set of actions is being implemented in Uzbekistan with the goal of securing continuous improvement of agro tourism alongside with other types of tourism and ensuring effective use of existent potential of the industry. The reason behind these actions is that this sphere has been attracting vast investments from a variety of sources (state property, private property of entrepreneurs, foreign investments). The principal objective of these actions is to preserve the touristic resources in the rural areas of Uzbekistan and provide conditions for their development. Actions are implemented in correspondence with the needs of tourists and requirements of destination areas. These includes such a way of management of all resources, which results in satisfaction of economic, social and aesthetic needs of population, securing preservation of cultural values, ecological and recreational resources, biological diversity and at the same time these resources and facilities will be used in the recreational activity of the local population. This process will lead not only to economic effectiveness, but also to social effectiveness.

Ecotourism is one of the most principal directions of Uzbekistan's tourism, because ecotourism resources in rural areas have been developed to a certain level. Total territory of areas which have special protection in Uzbekistan equal to 1355.6 thousand hectares (Aberkulov *et al.*, 2003) and total area of protected zones constitutes 460 thousand hectares (Egamberdiev *et al.*, 2004). However, these areas are not sufficiently utilized as a touristic resource in the field of eco-tourism in Uzbekistan. The reason behind this under-utilization is absence of eco-touristic tours and routes which are scientifically grounded and provide security to tourists and support

environmental protection of the areas. Moreover, these tours and routes are not provided to touristic companies.

As a consequence of lack of wild places with natural beauty, which have not been damaged by human intervention, the visits to such areas are limited and the prices of such tours are high. And this sphere of eco-tourism is not well-developed in Uzbekistan yet. Certain proportion of Uzbekistan's territory is occupied by mountains, gardens, hills, steppes as well as deserts. In such areas it is possible to construct and develop "black houses" and other facilities with the purpose of their inclusion into tour routes. Nowadays, the ecological crisis which has been taking place in Aral Sea dictates requirement for elaboration of specific eco-tours. It has to be specifically mentioned here, that Uzbekistan is witnessing appearance of new Aydar Lake which occupies vast territory. However, the potential of this lake is not thoroughly studied yet and the potential of this touristic resource is not used sufficiently.

At present time, there are 12 natural reserves in Uzbekistan, including Baday-Tuqay, Kizilkum, Nurota, Zarafshon, Orol Paygambar, Hisor, Zomin and Chatqal and these reserve areas are mainly used as a place for protection of the endangered species and plants (Hoshimov, 2009) and besides them, Uzbekistan fauna consists of 97 types of herbivorous animals, 424 types of birds, 58 types of vermigrade animals, 83 types of fish, while the flora of Uzbekistan is made up by more than 4100 types of plants. About 9% of plants which grow in Uzbekistan are endemic, i.e. these plants grow only in these areas. That is why, there is an opportunity to elaborate special tours which would inform the visitors about the unique flora and fauna of Uzbekistan and these tours would provide foundation for further sustainable development of tourism. As it can be noticed, the issue of development of ecological tourism in our country remains very important.

### **Perspectives of tourism development in rural areas of Samarkand region**

The issue of continuous development and effective utilization of historical, cultural and natural resources, which are available in rural areas throughout Uzbekistan, including Samarkand region, required for development of tourism are not analyzed and studied sufficiently. That is the reason why, it is of significant importance to further develop and research theoretical and practical aspects of new directions in effective utilization of tourist resources which exist in rural areas of the country.

Samarkand is one of the most suitable regions for development of tourism industry. Given tourism destination in terms of its administration is divided into 14 districts and 2 cities and it is located in an opportune location of Uzbekistan from natural and economic-geographical points of view. Total



area of the region is 16.4 thousands sq. km and population is about 3.4 million, 75% of which reside in rural areas. There are 118 tourism objects in Samarkand region (Turaev, 2004). These factors provide sufficient evidence of enormous opportunities for tourism development, particularly religious tourism, historical tourism, agro-tourism, ecological tourism, archeological tourism, recreational tourism, excursion (sightseeing) tourism, rural tourism.

Improvement and advancement of tourism services market plays very important role in provision of sustainable economic development of rural areas of Uzbekistan taking into account the importance of modernization and diversification of national economy. Analysis of this problem based on the case of rural areas of Samarkand region increases importance of this scientific issue. That is due to the fact that this area takes advantages of existence of organizational and legal basis for further advancement of tourism services.

Development of tourism services market in Uzbekistan demands efficient use of existent tourism potential in rural areas. It is absolutely necessary to conduct thorough scientific analysis of tourism possibilities in Samarkand region, provide scholastic assessment of their current conditions, secure comprehensive protection of tourism resources, develop perspective tours, using scientific methods, and create conditions to secure development of these types of tourism in selected rural areas.

There are numerous reasons for this. First and foremost, alongside with historical monuments there are enormous eco-touristic resources and recreational areas in Samarkand region. Secondly, large proportion of population of the city, region as well as guests from other regions, is keen on recreation and use of these facilities. Thirdly, national park area of Zarafshon is located in Samarkand region and the issues of development of scientific, ecological, recreational and other types of tourism using this destination area are on the agenda of this natural reserve area. Overall, there is sufficient potential to develop ecological and recreational tourism in the region.

Geographical and natural boundaries of Samarkand region consist of mountains and elevations on its northern, southern and north-east area borders. This develops solid foundation for development of tourism in rural areas. The boundaries of the region are divided by mountains of Nurota on the north and Zarafshon mountain system on the south (Ibodullaev, 2008). Natural position of the region had resulted in unique characteristics and features of its recreational facilities and resources. There are also plain areas in the region, which are comprised by steppes alongside Zarafshon River and deserts. That is why, there is a significant potential for development of relatively new types of tourism in the region such as ecotourism and agro-tourism.

Natural resources of Samarkand, for instance, beautiful landscape which evolved naturally in mountain and foothills, woodlands (national gardens), unique natural landscapes, salubrious water springs, gorgeous waterfalls and numerous unique destinations of natural beauty, improve tourism potential of our region. Zarafshon River is an area which well known for its richness in terms of ancient tourism objects.

It has to be mentioned here, that such places of natural beauty are widely spread in rural areas of Urgut, Samarkand, Jomboy, Nurobod, Koshrobot, Bulungur and other districts of Samarkand region, and it is very important to utilize this tourism potential. Natural resources of Samarkand region are distinct from other regions of our country owing to natural beauty, flora and fauna. Alongside with historical architectural and construction monuments as well as ancient places of interest, there are numerous plane trees and other types of threes and some of them are more than a thousand years old. At the same time, there are some issues and problems in our region, awaiting their solution; gradual elimination of these problems and issues will result in establishing tourism industry as a leading industry of regional economy. Therefore, acceleration and improvement of tours is considered as one of the most important tasks aimed at further continuous development of tourism industry of Samarkand region.

Evaluation and assessment of tourism resources, which are used in tourism locally, create solid foundation for identification of its future perspectives. Economic evaluation and assessment of existent touristic resources is related with the type of touristic resource, its quality, location, technology of use as well as environmental conditions of the resource. Under given circumstances, it is very important to conduct evaluation and assessment of touristic resources in terms of their quantity and quality. That is why, when we analyze the extent of use of touristic resources, which exist in tourism industry of Samarkand region, we can notice that demand on these touristic resources and the extent of their use are not sufficient and their share in economic sphere remains at relatively low level (table 1).

Table 1. Demand of touristic resources in Samarkand region and the extent of their use

Tourists resources	Demand from tourists		Potential of resource	Extent of the use
	<i>Local</i>	<i>International</i>		
Recreation and ecologic	<i>Low</i>	<i>High</i>	<i>High</i>	<i>Low</i>
Cultural and ethnographic	<i>Average</i>	<i>High</i>	<i>High</i>	<i>Low</i>
Historical and archeological	<i>Average</i>	<i>High</i>	<i>High</i>	<i>Average</i>
Religious	<i>High</i>	<i>High</i>	<i>High</i>	<i>Average</i>
Exotic environment	<i>Low</i>	<i>Average</i>	<i>Average</i>	<i>Low</i>
Quality of service	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>Low</i>

Source: Ibodullaev N.E. 2008.

It can be noticed from the table that, although the tourism potential of the resource is high, the extent, how these resources are used, stays at relatively low levels. At present, the situation remains still at the same degree. That is why, the issue of securing effective use of ecological, cultural and ethnographical resources remains among the most important ones. We conducted our scientific research and also targeted at improving effective use of existent touristic potential. We selected Zarafshon area, which is also named as national park, among existent touristic objects of rural areas of Samarkand region which are used in the field of recreational and ecological tourism. We provided information on arrivals of tourists into Samarkand region, both local and foreign tourists, on the line graph below (Figure 1).

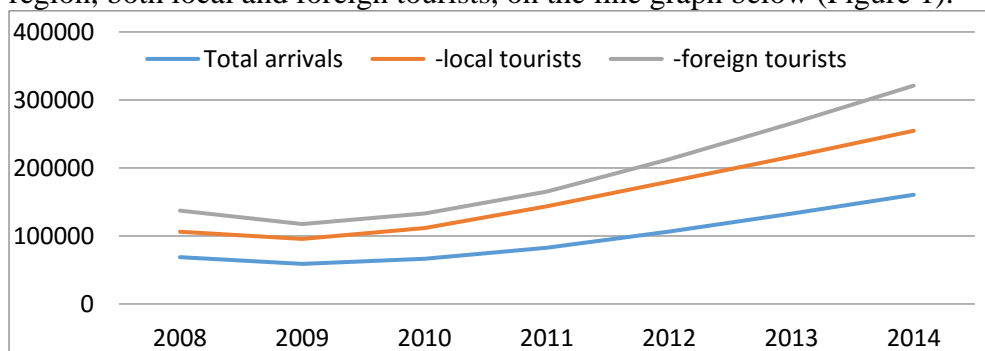


Figure 1. Tourists' arrivals into Samarkand region during the period 2008–2014

It can be noticed from the line graph that during the period from 2008 to 2014 number of tourist arrivals to Samarkand region grew constantly during last 5 consecutive years. If we analyze and divide the total flow of tourist arrivals into local and foreign arrivals into the region we can find out that the share of local tourists is higher. In 2014, the number of tourist arrivals in Samarkand region equaled to approximately 160 thousand people who traveled to Samarkand with the purpose of visiting touristic objects and enjoyed cultural and traditional types of tourism. From 2009 onwards the number of touristic arrivals grew significantly. If we compare the figures with other years we can notice that growth rate of arrivals to the region equaled to 36.6% in 2009, 41.4 % in 2010, 51.5% in 2011, 66.3% in 2012 and 82.7% in 2013. These changes confirm that the region's tourism industry is important factor of economic development of the region.

As it was mentioned above, Zarafshon national park, which is located not far from Samarkand, is considered as suitable touristic resource. This nature reserve is constantly visited by tourists residing in the region's 2 cities and 14 districts. During the analysis of the numbers of visits to this reserve we observed that this location is mainly visited by inhabitants of nearby regions and cities. This can be illustrated on the following figure (Figure 2).

It can be seen from the graph, that the tourist inflow into this natural reserve park is mainly formed by visitors who reside in the districts which are situated not far from the park such as Jomboy, Bulungur, Samarkand, Taylok as well as Samarkand city. Certain flow from Pastdargom region is there too. But we observe only very limited number of tourists from the distant regions (Kattakurgan, Narpay, Pakhtachi, Nurobod, Payarik regions and Kattakurgan city).

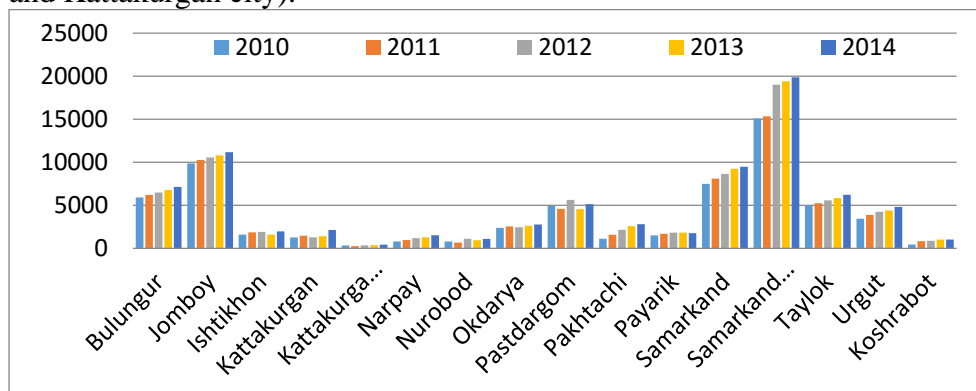


Figure 2. Inflow of visitors in Zarafshon national park from different regions during the period 2010-2014.

We can see from this line graph that during 2010 and 2014 there was constant growth in terms of inflow of tourists from different areas of Samarkand region into Zarafshon national park. The main direction scientific research conducted by our team is analysis of the proportion and share of tourism services market in the overall economic development of rural areas. That is why, being unique destination which is well known for its unique landscape and natural beauty, Zarafshon national park is considered as one of the most suitable locations in Samarkand region.

### Methodology and data collection

In the given article, visits to rural areas by tourists of Samarkand region are theoretically explained and factors of tourism development are evaluated based on practical information. Alongside with this, we performed following sets of tasks within the research: analysis of economic potential of Uzbekistan tourism industry, analysis of inflow of tourists into Zarafshon national park, which is located in rural area of Samarkand region, “Gravity” model is theoretically explained and practically based at the same time economic evaluation of tourist flows between the areas.

### Theoretical foundation of “Gravity” model

“Gravity” model is widely used in explanation of volumes and flows of trade and investment between different countries of the world and is

considered as a reliable tool for analysis of international trade flows. Given model is based on the law of “Attractive force” by I. Newton and was used for the first time by Dutch economist in the economic sphere, particularly in analysis of international flows of trade (Tinbergen, 1962).

Then, numerous scientists and researchers continued and improved the main theoretical components of the model and later given model was widely used in different sectors of economy. For instance, the volume of international trade between the countries was identified for the first time (Pöyhönen, 1963) and later (Linnemann, 1966); bilateral trade processes were analyzed (Prentice *et al.*, 1998); volumes of export potential of the Middle East and North Africa countries (Söderling, 2005) was identified; global trade and potential for global trade of such countries as Turkey (Ozdeser *et al.*, 2010) was evaluated; the model was used by researchers and scientists in assessment of the factors which impact Italian agriculture and food industry (Crescimanno *et al.*, 2013) and export potential of Egyptian agriculture (Hatab *et al.*, 2010). On top of that, this model was widely used in conducting analysis of tourism economics by numerous researchers. As it was mentioned above, the sphere of tourism also plays very important role in identification of international trade flows. Given processes became a key object in a variety of research works, because they were very useful and effective tool in directing investment flows into rural areas and had very wide development perspectives.

Increased attention which has been paid to this issue during recent years indicated significant importance. Stability of tourism market, tourism trade and its development and relations with economic geography (Alvaro, 2004), key factors which identify the inflow of tourists into the destinations (Karagöz *et al.*, 2014) and incomes from tourists, who arrival using relatively new sphere of tourism - agro-tourism (Santeramo *et al.*, 2008) as well as main influential indicators of international tourism which have impact on Greek economy (Chasapopoulos *et al.*, 2014) are studied and evaluated on the basis of this model.

Distance between two areas and economic volumes of trade flows between these areas are forecasted in social sciences which base their forecasts on the model that is similar to “Gravity” model in international economic relations. The main form of “Gravity” model which is used for trade flows between two areas is provided below:

$$T_{ij} = \alpha \frac{(GDP_i GDP_j)}{D_{ij}}$$

Where,

$T_{ij}$  – trade volumes which attracted from  $i$  area to  $j$  area;

$GDP_i$  and  $GDP_j$  – indicators of GDP of  $i$  area and  $j$  area;

$D_{ij}$ —means distance between i area j area;

$\alpha$  – constant parameter (constant).

While evaluating tourism demand, Crampon (1996); Stephen *et al.* (1995); Rodrigue *et al.* (2006) and Rajeeshwaran (2014) added some factors and optional parameter in variables in the model which used “Gravity” model as a basis. The model which is proposed to the sphere of tourism industry is as following:

$$Tt_{ij} = \alpha \frac{(M_i M_j)}{D_{ij}}$$

Where,

$Tt_{ij}$  – demand for tourism coming from i area to j area;

$M_i$  &  $M_j$  – population in i area and j area;

$D_{ij}$ —means distance between i area j area;

$\alpha$  – constant parameter (constant).

“Gravity” equation is considered to have many-particle character. We intend to conduct analysis of economic relations and economics of tourism between two specified areas using abovementioned equation, i.e. the volume of tourists arriving to specified areas. It is possible to use abovementioned equation to identify the tourist flows between two areas, population of identified areas and distance, identify natural logarithm and identify their linear relationships. According to this, we need to transform abovementioned equation into linear form finding natural logarithm:

$$\ln Tt_{ij} = \beta_1 \ln \alpha + \beta_2 \ln(M_i M_j) - \beta_3 \ln D_{ij} + \varepsilon_{ij}$$

Where,

$\beta_1 \beta_2 \beta_3$ — determinate parameters;

$\varepsilon_{ij}$  – approved error level.

## Data collection

In order to conduct analysis statistical information for the period from 2010 to 2014 was gathered from 16 local areas of Samarkand region and these selected areas are accepted as principal partner organizations which send their tourists to Zarafshon national park area. The principal basis of gathered statistical data is the number of agro and eco tourists who arrive to Zarafshon national park. Above mentioned statistical information is collected during observations as well as from annual statistical reports from Statistical department of Samarkand region and Zarafshon national park.

## Estimation result of the Gravity model

The analysis was conducted on the basis of STATA 12 software. The calculation of numbers of tourists who arrive to Zarafshon national park, located in Jomboy district of Samarkand region, was done using economic-

mathematic model. Hence, in given article we conducted analysis of such parameters of “Gravity” model as ordinary least squares (OLS), mean-square error and covariance (table 2).

Table 2. Regression result of “Gravity” model

Source	SS	df	MS	Number of obs.	=	80
Model	72.088884	2	36.044442	F ( 2, 77)	=	176.78
Residual	15.700111	77	0.203898	Prob. > F	=	0.0000
Total	87.788995	79	1.1112531	R-squared	=	0.8212
				Adj. R-squared	=	0.8165
				Root MSE	=	0.4515
Ln(vis.)	Coefficients	Std Error	t-stat	P>  t	[ 95% Conf. interval ]	
Ln(pop.)	1.032338	0.110803	9.32	0.000*	0.811701	1.252976
Ln(dis.)	-0.907661	0.068413	-13.27	0.000*	-1.043389	-0.771434
Intercept	-0.987392	1.445961	-0.68	0.497	-3.866669	1.891885
Significant: *at 1%, **at 5%, and ***at 10%.						
Akaike Information Criterion			=102.7615		Schwarz Information Criterion =109.9075	
Hannan-Quinn Information Criterion			=105.6265		Durbin Watson =0.1075	

From information provided in the Table 2 it can be seen that “t” and “F” statistic have positive impact on the value of “P”. In the given model selected independent and co-dependent variable factors provide appropriate support to each other. Taking into account the characteristics of “t” statistic it can be said that the numbers of population of the area (**Ln(pop.)**) is a positive factor of the number of local tourists (**Ln(vis.)**) visiting Zarafshon national park in Samarkand region who visit this place for cultural and recreational purposes while distance between the areas (**Ln(dis.)**) is a negative factor. “P” values of “F” statistic equals to 176.78 and it is lower than 0.001. It can be seen that, the overall importance of “Gravity” model is quite significant. When we identified  $R^2$  it equaled to 0.8212. It draws a conclusion that it corresponds with information and statistical data which was gathered during observation. It is understood that that the overall number of population of the area has positive impact on the flow of tourists to Zarafshon national park and its statistical parameters comply with provided theories (Gujarati, 2003) and meets initial expectations. However, second factor which was selected in this regression model, i.e. distance between the areas, has corresponding negative impact. At the same time, its statistical parameters are regarded as negative parameters.

## Conclusion

It can be concluded that there is enormous potential to develop agro and eco-tourism in rural areas of Uzbekistan. However, although this issue has been thoroughly studied by various scientists, there is a lack of evidence of scientific research on the ecological tourism resources of Samarkand region and the ways of their efficient use. In the given article, the issue was analyzed on the basis of “Gravity” model approach and forecasted indicators

of tourism flows were calculated. According to the research results, the model is very useful tool to obtain the size of tourism flows in rural areas. Several scientific-practical recommendations were developed on the basis of the given research.

1. Elaboration and provision of scientific grounds for touristic tours which are adequate for local and foreign tourists in order to develop ecologic and agro-tourism in Samarkand region

2. Taking into account importance of development of tourism industry, it is advisable to use economic-mathematical methods in identification of forecast indicators and it is also required to solve the issue of implementing these methods both in education institutions and practice.

3. As one direction of eco-tourism includes learning national values and traditions, we think that it is reasonable to include existent ancient bazaars and objects which preserve national traditions and customs into the places of visit for variety of tours.

If our recommendations are implemented, we think that, we can secure development of agro and eco tourism and this will result in development of rural economies.

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